

# Concepts for measuring temperature

SITRANS T – a broad product family for every application



## SITRANS T

Answers for industry.

**SIEMENS**

# The SITRANS T family

High-precision, intrinsically safe, and available for a wide variety of sensors



Sensor and transmitter for installation in the connection head, on the DIN rail, in the field or complete measurement point. With Siemens, you can get everything complete or as individual components, according to requirements.

## The SITRANS T family for





- Installation in the connection head:  
SITRANS TH100, TH200, TH300 and TH400
- DIN rail installation:  
Two-wire devices SITRANS TR200 and TR300  
Four-wire device SITRANS TW
- Field installation: SITRANS TF and TF2
- Sensors for pipes and vessels, combustion plants and furnaces, hygiene applications, humid areas and confined spaces






Our head-, DIN-rail or field-mounted transmitters and sensors of the SITRANS T family provide highly accurate measurement and can be connected quickly to a wide variety of thermocouples and resistance thermometers as well as to mV sensors and RTDs. They work with galvanic isolation and selectable line frequency.

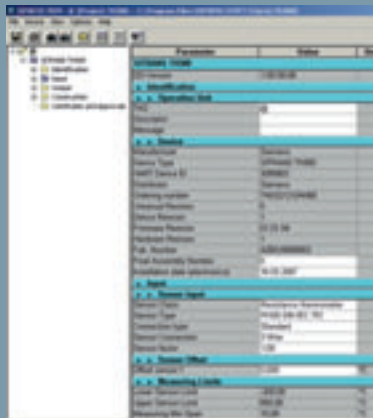
## Well protected

You can also choose between non-intrinsically safe, intrinsically safe and explosion-proof versions. And you don't have to wait either, because our SITRANS T temperature transmitters are in stock.

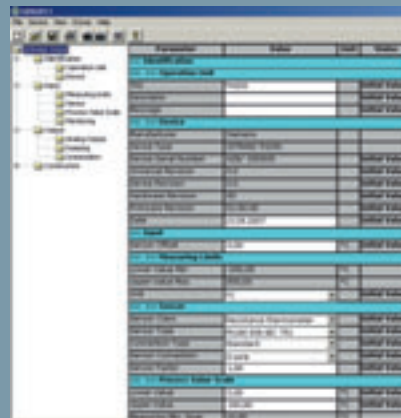


Installation	In the connection head			
Art	Two-wire			
				
Type	SITRANS TH100	SITRANS TH200	SITRANS TH300	SITRANS TH400
Input (connectable sensors)	Pt 100 resistance thermometers	Resistance thermometers Thermocouples Resistance-type sensors DC sources	Resistance thermometers Thermocouples Resistance-type sensors DC sources	Resistance thermometers Thermocouples Resistance-type sensors DC sources
Output	4 to 20 mA	4 to 20 mA	4 to 20 mA, HART	PROFIBUS PA (variant) Foundation Fieldbus (variant)
Local display				
Power supply	8.5 to 36 V DC (30 V for Ex ia)	11 to 35 V DC (30 V for Ex ia)	11 to 35 V DC (30 V for Ex ia)	9 to 32 V DC (30 V for Ex ia and 17.5 V for FISCO)
Housing material	Molded plastic, embedded electronics	Molded plastic, embedded electronics	Molded plastic, embedded electronics	Molded plastic, embedded electronics
Ambient temperature	–40 to +85 °C	–40 to +85 °C	–40 to +85 °C	–40 to +85 °C
Degree of protection	IP40	IP40	IP40	IP40
Approvals	Europe (ATEX): EEx ia, Ex n  USA (cFMus): IS, NI Canada (cFMus): IS, NI	Europe (ATEX): EEx ia, Ex n  USA (cFMus): IS, NI Canada (cFMus): IS, NI	Europe (ATEX): EEx ia, Ex n  USA (cFMus): IS, NI Canada (cFMus): IS, NI	Europe (ATEX): EEx ia or EEx ib, Ex n USA (FM): IS, NI Canada (CSA): IS, NI
Operator input				
SIMATIC PDM			•	PROFIBUS PA version
Handheld 375			•	FF version
AMS			•	FF version
SIPROM T and special modem	•	•		
Local configuration using 3 push buttons				

On DIN rail			Field device	Digital display thermometer
Two-wire		Four-wire	Two-wire	Two-wire
				
<b>SITRANS TR200</b>	<b>SITRANS TR300</b>	<b>SITRANS TW</b>	<b>SITRANS TF</b>	<b>SITRANS TF2</b>
Resistance thermometers Thermocouples Resistance-type sensors DC sources	Resistance thermometers Thermocouples Resistance-type sensors DC sources	Resistance thermometers Thermocouples Resistance-type sensors DC sources Current sources	Resistance thermometers Thermocouples Resistance-type sensors DC sources	Integrated Pt100
4 to 20 mA	4 to 20 mA, HART	0/4 to 20 mA, HART 0/2 to 10 V, HART	4 to 20 mA (version) 4 to 20 mA, HART (version)	4 to 20 mA
			LCD	LCD
11 to 35 V DC (30 V for Ex ia)	11 to 35 V DC (30 V for Ex ia)	115/230 V UC or 24 V UC	13.1 to 35 V DC (30 V for Ex ia)	12 to 30 V DC
Molded plastic	Molded plastic	Molded plastic	Varnished die-cast aluminum or stainless steel	Stainless steel
−40 to +85 °C	−40 to +85 °C	−25 to +70 °C	−40 to +85 °C	−25 to +85 °C
IP20	IP20	IP20	IP68	IP65
Europe (ATEX): EEx ia or EEx ib, Ex n	Europe (ATEX): EEx ia or EEx ib, Ex n	Europe (ATEX): EEx (ia) or EEx (ib)	Europe (ATEX): EEx ia, EEx d, Ex n USA: XP/DIP/NI/S	
	•	•	HART universal version	
	•	•	HART universal version	
	•	•	HART universal version	
•			4 to 20 mA HART universal version	
				•



SITRANS TH300 parameter display  
in SIMATIC PDM



SITRANS TH200 parameter display  
in SIPROM T

## Operation

Thanks to their EDD technology, our fieldbus/HART transmitters can be easily integrated in different process control systems. The configuration tool of choice is SIMATIC PDM (Process Device Manager), a consistent, vendor-independent tool for operation, setup, maintenance and diagnosis of intelligent field devices. It is used with our PROFIBUS PA devices.

For Foundation Fieldbus, AMS or the F Communicator offer easy integration.

Our HART devices are integrated in SIMATIC PDM and in AMS as well as in the HART Communicator, offering the user many choices. An offline solution is available for SITRANS TH100, TH200, TR200 and TF in the 4 to 20 mA universal version.

Our special modem, available in a USB or RS232 version, ensures good connections – even without auxiliary power in the USB version. The SIPROM T operating tool makes configuration a snap. This tool reflects the advance operating philosophy and look and feel of SIMATIC PDM, so that it is also familiar to the SIMATIC PDM user.





# SITRANS TH

The cool head for hot spots



SITRANS TH – the smallest in our family – suitable for everything from simple applications right up to PROFIBUS and Foundation Fieldbus

## Small, user-friendly, safe

Thanks to its compact design, it allows use in the low-cost connection head Form B, even in the flat-cover version where it is installed in place of the terminal block. It also has a host of user-friendly and safe features such as galvanic isolation to 500 V AC, Ex approval and ruggedness at temperatures ranging from a shivering  $-40^{\circ}\text{C}$  to a sweltering  $85^{\circ}\text{C}$ .

And the configuration? SIMATIC PDM is the tool of choice for the PROFIBUS version of the TH400. AMS or the FF Communicator is used for the TH400 Foundation Fieldbus device. The HART-enabled TH300 offers user-friendly operation using SIMATIC PDM or HART Communicator. On the TH200 and TH100, a special modem and the SIPROM T software ensure a good connection.

Thanks to clear functional positioning, all users will find the device that ideally supports their requirements. The TH400 is suitable for Fieldbus installa-

tions, whether these are PROFIBUS PA or Foundation Fieldbus installations. The measured value from the microprocessor is made available on the Fieldbus with status as a quality specification and further parameters such as galvanic isolation. Sensor, limit values, failure behavior, etc., are programmable. Sensor redundancy via two sensor inputs is another highlight. The SITRANS TH400 thus offers you the most varied diagnostics and simulation options. If HART-compatibility is required, the SITRANS TH300 is the right choice. With measuring technology that is as universal as it is accurate, the PC-programmable TH200 offers countless application options. Both devices are characterized by versatile diagnostics and simulation options and by a unique, service-friendly design. The operating status of the device, for example, can be seen at a glance thanks to the two-color LED. The technician simply connects an ammeter via the test sockets and can then read the output current without opening the measuring circuit. Consistently cost-optimized (by dispensing with galvanic isolation, for example), the TH100 is suitable for PT100 sensors.



## SITRANS TF

The field transmitter for rugged industrial environments

Because it has IP68 protection,  
SITRANS TF is used in environments  
too tough for other transmitters.

### Robust and well protected

SITRANS TF is available in your choice of a rugged die-cast aluminum or durable stainless-steel housing. It converts signals from resistance thermometers, resistance-type sensors, thermocouples and voltage sensors into direct current signals in accordance with the sensor characteristic. The remote sensor mount capability of the SITRANS TF allows the electronics to be isolated from possible high process temperatures and vibration.

When measuring points are in a tough area, you can install your SITRANS TF in a more easily accessible location. The SITRANS TF is available with local indicating display. There is also a version for explosion-proof hazardous locations.

SITRANS TF2 integrates three elements in one device: a Pt100 resistance thermometer in a stainless-steel thermowell, a high-grade stainless-steel housing with a high degree of protection, and a built-in measuring transmitter with LC display with three configuration push buttons.



# SITRANS TW and SITRANS TR

For rail installation



SITRANS TR and SITRANS TW are the universal specialists for DIN rail installation. They provide comprehensive diagnostic and simulation capabilities.

## Two-wire SITRANS TR

When connected directly in the 4 to 20 mA loop, these devices require no auxiliary power supply. They are installed in junction boxes or in the control room close to the process, thus permitting centralized access to all connected measurement points.

If HART compatibility is required, the SITRANS TR300 is the right choice. The comprehensive diagnostic capabilities can be exploited online. The device is easy to operate via SIMATIC PDM or HART-Communicator. With measuring technology that is as universal as it is accurate, the PC-programmable TH200 offers countless application options. A special modem in conjunction with the SIPROM T software ensures good connections.

Both devices are characterized by versatile diagnostics and simulation options and by a unique, service-friendly design. The operating status of the device, for example, can be viewed at a glance thanks to the two-color LED. The technician simply connects an ammeter via the test sockets and can then read the output current without opening the measuring circuit.

## Four-wire SITRANS TW

The separate auxiliary power connection ensures the great flexibility of these devices in view of the output signals. For example, the SITRANS TW provides not only the most commonly used 4 to 20 mA output signal but can also be configured for 0–20 mA and 0–10 V or 2–10 V via HART protocol. A relay output provides additional options. And the configuration? The HART-enabled SITRANS TW is conveniently operated via SIMATIC PDM or HART-Communicator.





# Sensors

A complete range of products!



## Complete measuring solutions for all applications

When it comes to transmitters and sensors, the SITRANS T family can meet your every demand. Regardless of the market and application for which measuring points are needed, we provide all the support and know-how you need.

## A selection of suitable materials for the sheath and thermowell

Does your application involve high temperatures, high pressure or aggressive media, or are your temperature measurements made in fast-flowing media? We can help you find just the right solution. You also have a choice of mounting options. Whether mounting flange, threaded or weld – no problem.

## All conventional sensors

With Siemens universal transmitters, you can have the sensor of your choice. Choose your sensor from a wide variety of thermocouples or resistance thermometers. Whatever your choice, we configure the transmitter to the sensor you select.

It makes no difference whatsoever whether you want to measure low or high temperatures or whether you use thermocouples or resistance thermometers. Even if you want to measure direct voltages or direct currents, the transducers of the SITRANS T family are your smart choice.

The very finest temperature sensors (Pt100, Class A) are available for applications in the pharmaceutical, food & beverage and biotechnology industries. These sensors are equipped with the process connection required

in these industries, and are designed in accordance with hygiene requirements. Construction and materials meet FDA and EHEDG standards, and are manufactured under GMP guidelines. The temperature sensors can be installed in tubes, containers or as clamp-ons for measuring temperature without media contact.

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